

1046-52-1511

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University of South Carolina, Columbia, SC 29208. *Isodiametric problems for equilateral polygons.*

The maximal perimeter of a convex polygon having unit diameter and a fixed number of sides n is achieved only by certain equilateral polygons, provided that n has an odd prime divisor. Some prior work of the author and others considered the problem of constructing polygons with large perimeter when n is a power of 2. We describe how an experimental approach, combining numeric and symbolic computations, was employed in some recent investigations of two related problems about polygons. The first considers the construction of *equilateral* convex polygons with unit diameter, 2^m sides, and large perimeter. The second investigates the combinatorial problem of determining the number of essentially different polygons that exhibit the optimal perimeter for any fixed n . (Received September 15, 2008)